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REMARKS

At the outset, withdrawn claims 1-17 and 33-42 are now canceled without prejudice to filing these claims in a divisional application.

THE OBJECTION

The disclosure was objected to by the Examiner due to informalities. The Examiner reads that the following elements were disclosed as being optional, a front grapple (para. 0031), a guide (para. 0037), a rear grapple (para. 0035) and a tertiary mirror (para. 0023) but they were required by the claim language and therefore no longer optional. Appropriate correction was requested by the Examiner.

Regarding a front grapple (para. 0031), a rear grapple (para. 0035) and a tertiary mirror (para. 0023), the applicant has complied with the request through the proffered amendment.

The applicant respectfully traverses the Examiner's reading that a guide, as referenced to by the claims, was originally disclosed as being optional. Paragraph 0033 reads "A guide 62 is also preferably added to the backside 54..." The word "optional" or its equivalent is absent. Paragraph 0037 reads, "A guide (not shown) may be optionally attached to one or more of the respective trusses 66 or interlocking attachments 70, or both, that couples with the respective guide 62..." It can be appreciated that the guide that the Examiner referenced to in paragraph 0037 is an entirely different element from the guide 62 disclosed in paragraph 0033, and is attached to an entirely different position (trusses or interlocking attachments rather than the backside 54). Furthermore, paragraph 0047 reads "The robot 101 continues to move the segmented optics 40 downward until

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the guide 62 is properly seated onto one or more of the trusses 66 or onto the respective guides 77." It can also be appreciated from paragraph 0047 that there are two kinds of guides disclosed in the application. The claims in question are all concerned with the guides 62 attached to the backside of the modular segmented optics, where are never disclosed as being optional.

It is the applicant's position that the Examiner's objections have been overcome by the proffered amendment and the argument presented above.

THE REJECTION

1. Claims 1-4, 6-12, 18-20, 22 and 24-32 (and in fact claims 43 and 44) stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenell (US 5,157,556).

Regarding claims 1, 18 and 30, the Examiner's position is that Hugenell teaches every limitation of the present invention except for the use of a satellite.

Regarding claims 2, 9, 11, 24 and 31, the Examiner's position is that Hugenell teaches every limitation of the present invention except for the front grapple.

Regarding claims 3 and 20, the Examiner's position is that Hugenell teaches all the limitations further introduced by claims 3 and 20.

Regarding claims 4, 8, 10 and 19, the Examiner's position is that Hugenell teaches all the limitations further introduced by claims 4, 8, 10 and 19.

Regarding claims 6, 7 and 22, the Examiner's position is that Hugenell teaches all the limitations further introduced by claims 6, 7 and 22.

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Regarding claims 12 and 29, the Examiner's position is that Hugenell teaches all the limitations further introduced by claims 12 and 29.

Regarding claim 25, the Examiner's position is that Hugenell teaches all the limitations further introduced by claim 25.

Regarding claims 26 and 27, the Examiner's position is that Hugenell teaches every element of the present invention except for automating the assembly procedure of the modular segmented optics.

Regarding claim 28, the Examiner's position is that Hugenell teaches all the limitations further introduced by claim 28.

Regarding claim 32, the Examiner's position is that Hugenell teaches all the limitations further introduced by claim 32.

Regarding claims 43 and 44, the Examiner's position is that Hugenell teaches all the limitations further introduced by claims 43 and 44 except for a tertiary mirror.

2. Claims 5, 21 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenell (US 5,157,556) in view of Callender (US H783).

It is the Examiner's position that Hugenell teaches every element of the invention except for the secondary mirror and the Examiner relied on Callender to teach the secondary mirror.

ARGUMENT RE THE REJECTION

Of the claims examined (claims 1-12, 18-32, 43 and 44), claims 1, 18, 30 are independent claims and all the other claims depnd directly or indirectly on one of them.

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A review of the foregoing grounds of rejections indicate that any arguments capable of proving that Hugenell fails to teach every limitation recited in Claims 1, 18 and 30 even if Hugenell had taught the use of a satellite would remove Hugenell as a valid reference for the Examiner's grounds of rejections.

A significant distinguishing feature of the present invention over the cited prior art is the fact that not only the mirrors, but also the backing structure are modularly manufactured and assembled during the final installation.

Support for the modular backing structure in the present invention is found both in the specification and the claims. Claim 1 recites "...a primary mirror comprising a plurality of modular segmented optics coupled to a modular mirror backing structure..." Claim 18 recites "...forming a modular mirror backing structure from said plurality of interlocking modular segments..." Claim 30 recites "...coupling a secondary mirror to said modular mirror backing structure..."

It is the applicant's position that there is no teaching or suggestion in Hugenell for having a modular backing structure. There are at least two instances where Hugenell used the word "individual" in reference to certain features of the backing structure. Column 5, lines 25-27 recites "on the underside, each reflector body 1 to 11 is provided with boreholes 21, into which the individual support and adjustment elements 12 engage." Column 5, lines 31-35 recites "as shown in Fig. 4, the individual support and adjustment elements 12 penetrate the boreholes 21 on the undersides of the individual reflector bodies 9, without, however, protruding over their reflector surface." It can be appreciated that while Hugenell discloses "individual reflector bodies", Hugenell does not suggest an individual/modular backing structure. The "individual support and adjustment elements"

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on the backing structure do not indicate the backing structure per se as being individual/modular. Only the supporting and adjustment means are individual ones so that each reflector body can be separately installed and adjusted.

The modular backing structure is not only a claimed subject matter, but also a crucial element of the present invention. The modular backing structure, in combination with the modular mirrors, allows the telescope to be assembled in space using small parts that can be easily accommodated by current launching vehicles. A backing structure that is as large as the finished telescope is not suitable for current launching vehicles.

Further, the applicant respectfully traverses the Examiner's reading that Hugenell shows interlocked mirrors, which is another distinguishing feature of the present invention over the cited prior art. In particular, the opposition is related to the following reading by the Examiner in the office action on Page 8, "The term interlock is defined as connected so that the motion or operation of any part is constrained by another. The applicant admits the mirrors shown in Fig. 1 abut one another. Therefore the mirrors are constrained from any motion in the plane of the mirror. Further, Hugenell reference suggests that the mirrors are further connected by saying the outer mirrors are "joined" to the inner mirrors (col. 5 lines 1-3). The Hugenell reference satisfies the broadest reasonable interpretation of the term interlock."

It is the applicant's position that Hugenell does not show mirrors that "are constrained from any motion in the plane of the mirror." The notion that Hugenell teaches interlocked mirrors is in contradiction with its disclosures.

First, in discussing the prior art, Hugenell recites "on thrusts due to wind and on temperature variations, the positions of the individual very thin-walled hexagonal

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reflector bodies have to be readjusted...At the edges of the reflector bodies, sensors are provided measuring the displacements of adjacent reflector bodies with respect to each other." (Column 1, lines 42-51).

Second, in discussing its invention, Hugenell recites "On the undersides of the reflector bodies, support and adjustment elements are disposed, to which belong, of course, inclination sensors, too. Thus, each reflector body can be controlled separately for adjustment to a common focus." (column 3, lines 56-60), and "displacement sensors 100 are located, further, directly in the individual hollow spaces of the reflector bodies..." (column 6, lines 10-12).

It can be appreciated that Hugenell contemplates adjusting each mirror separately and anticipates the possibility that the mirrors may be displaced relative to one another. Therefore, Hugenell, despite that it shows abutting mirrors, does not teach or suggest interlocking the mirrors and preventing any motion therebetween.

In summary, it is the applicant's position that the cited references do not teach all the limitations of the present invention, either considered alone or in combination.

Therefore, the rejection of claims 1-12, 18-32, 43 and 44 under 35 U.S.C. 103(a) over the cited prior art should be withdrawn and the new claims 45-50 (all dependent) are also allowable.

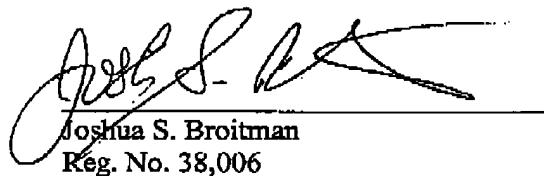
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It is submitted that there is no *prima facie* evidence for obviousness and the allowance of the claims in the present invention is respectfully requested.

Respectfully submitted,

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